WHAT IS CLAIMED IS:

1. A transcoder for transcoding data comprising a group of macroblocks representing a frame of data, the transcoder comprising:

a decoder capable of decoding input data to thereby generate prediction error and decoded image data in a spatial domain;

a downsampler capable of downsampling one of the prediction error and the decoded image data in at least one of a first direction and a second direction different than the first direction to generate a downsampled macroblock in the spatial domain; and

an encoder capable of encoding the downsampled macroblock into output data.

2. A transcoder according to Claim 1, wherein the decoder comprises:

a variable-length decoder capable of variable-length decoding input data to generate quantized Discrete Cosine Transform (DCT) coefficients;

an inverse quantizer capable of inverse quantizing the quantized DCT coefficients to generate DCT coefficients;

an inverse DCT-coder capable of inverse DCT-coding the DCT coefficients to generate the prediction error in the spatial domain; and

a summing element capable of summing the residual blocks and motion compensation data to generate the decoded image data.

3. A transcoder according to Claim 1, wherein the decoder is capable of decoding the input data at a reduced resolution.

4. A transcoder according to Claim 3, wherein the decoder is capable of decoding the input data further including downsampling the input data, including the prediction error and the decoded image data, in the first direction, and wherein the downsampler is capable of downsampling one of the prediction error and the decoded image data in the second direction in the spatial domain.

5. A transcoder according to Claim 1 further comprising:

an intra/inter selector capable of determining to pass to the downsampler and encoder one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

6. A transcoder according to Claim 1, wherein the encoder comprises:

a Discrete Cosine Transform (DCT)-coder capable of DCT-coding the downsampled macroblock into DCT coefficients in a DCT domain;

a quantizer capable of quantizing the DCT coefficients; and

a variable-length encoder capable of variable-length coding the DCT coefficients into output data.

7. A transcoder according to Claim 1, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein the downsampler is capable of downsampling one of the prediction error and the decoded image data in the second direction by skipping one of a top and a bottom field of the frame of data when the data comprises interlaced data, and skipping every other sample line of the frame of data when the data comprises non-interlaced data.

8. A transcoder according to Claim 1, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein the downsampler is capable of downsampling one of the prediction error and the decoded image data in the first direction by one of skipping every other sample of each sample line of the frame of data and averaging every pair of neighboring samples of each sample line.

9. A transcoder for transcoding data comprising a group of macroblocks representing a frame of data, the transcoder comprising:

a reduced-resolution decoder capable of decoding input data to thereby generate decoded image data at a reduced resolution and downsample the input data in a first direction;

a downsampler capable of downsampling the decoded image data in a second direction different than the first direction to generate a downsampled macroblock; and

an encoder capable of encoding the downsampled macroblock into output data.

10. A transcoder according to Claim 9, wherein the decoder capable of decoding input data to thereby generate the decoded image data in a spatial domain and a prediction error in the spatial domain, and wherein the downsampler is capable of downsampling one of the prediction error and the decoded image data to generate the downsampled macroblock.

11. A transcoder according to Claim 10 further comprising:

an intra/inter selector capable of determining to pass to the downsampler and encoder one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

12. A transcoder according to Claim 9 further comprising:

a mixed block processor capable of converting at least one of the macroblocks of the decoded image data from a first coding mode to a second coding mode before the downsampler downsamples the decoded image data.

13. A system of transcoding data comprising a group of macroblocks representing a frame of data, the system comprising:

a network entity capable of decoding input data to thereby generate prediction error and decoded image data in a spatial domain, wherein the network entity is also capable of downsampling one of the prediction error and the decoded image data in at least one of a first direction and a second direction different than the first direction to generate a downsampled macroblock in the spatial domain, and wherein the network entity is capable of encoding the downsampled macroblock into output data.

14. A system according to Claim 13, wherein the network entity is capable of decoding the input data by variable-length decoding input data to generate quantized Discrete Cosine Transform (DCT) coefficients, inverse quantizing the quantized DCT coefficients to generate DCT coefficients, inverse DCT-coding the DCT coefficients to generate the prediction error in the spatial domain, and thereafter summing the residual blocks and motion compensation data to generate the decoded image data.

15. A system according to Claim 13, wherein the network entity is capable of decoding the input data at a reduced resolution.

16. A system according to Claim 15, wherein the network entity is capable of decoding the input data further including downsampling the input data, including the prediction error and the decoded image data, in the first direction, and wherein the network entity is capable of downsampling one of the prediction error and the decoded image data in the second direction in the spatial domain.

17. A system according to Claim 13, wherein the network entity is capable of determining to downsample and encode one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

18. A system according to Claim 13, wherein the network entity is capable of encoding the downsampled macroblock by Discrete Cosine Transform (DCT)-coding the downsampled one of the residual block and the decoded macroblock into DCT coefficients in a DCT domain, quantizing the DCT coefficients, and thereafter variable-length coding the DCT coefficients into output data.

19. A system according to Claim 13, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein the network entity is capable of downsampling one of the prediction error and the decoded image data in the second direction by one of skipping one of a top and a bottom field of the frame of

data when the data comprises interlaced data, and skipping every other sample line of the frame of data when the data comprises non-interlaced data.

20. A system according to Claim 13, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein the network entity is capable of downsampling one of the prediction error and the decoded image data in the first direction by one of skipping every other sample of each sample line of the frame of data and averaging every pair of neighboring samples of each sample line.

21. A system of transcoding data comprising a group of macroblocks representing a frame of data, the system comprising:

a network entity capable of decoding input data to thereby generate decoded image data at a reduced resolution and downsample the input data in a first direction, wherein the network entity is also capable of downsampling the decoded image data in a second direction different than the first direction to generate a downsampled macroblock, and wherein the network entity is capable of encoding the downsampled macroblock into output data.

22. A system according to Claim 21, wherein the network entity is capable of decoding input data to thereby generate the decoded image data in a spatial domain and a prediction error in the spatial domain, and wherein the network entity is capable of downsampling one of the prediction error and the decoded image data to generate the downsampled macroblock.

23. A system according to Claim 22, wherein the network entity is further capable of downsampling and encoding one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

24. A system according to Claim 21, wherein the network entity is further capable of converting at least one of the macroblocks of the decoded image data from a

first coding mode to a second coding mode before the downsampling the decoded image data.

25. A method of transcoding data comprising a group of macroblocks representing a frame of data, the method comprising:

decoding input data, wherein decoding input data comprises generating prediction error and decoded image data in a spatial domain;

downsampling one of the prediction error and the decoded image data in at least one of a first direction and a second direction different than the first direction, wherein downsampling comprises downsampling in the spatial domain to generate a downsampled macroblock in the spatial domain; and

encoding the downsampled macroblock into output data.

26. A method according to Claim 25, wherein decoding input data comprises:

variable-length decoding input data to generate quantized Discrete Cosine Transform (DCT) coefficients;

inverse quantizing the quantized DCT coefficients to generate DCT coefficients;

inverse DCT-coding the DCT coefficients to generate the prediction error in the spatial domain; and

summing the residual blocks and motion compensation data to generate the decoded image data.

27. A method according to Claim 25, wherein decoding input data comprises decoding input data at a reduced resolution.

28. A method according to Claim 27, wherein decoding input data further comprises downsampling the input data, including the prediction error and the decoded image data, in the first direction, and wherein downsampling comprises downsampling one of the prediction error and the decoded image data in the second direction in the spatial domain.

29. A method according to Claim 25 further comprising:

determining to downsample and encode one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

30. A method according to Claim 25, wherein encoding the downsampled macroblock comprises:

Discrete Cosine Transform (DCT)-coding the downsampled macroblock into DCT coefficients in a DCT domain;

quantizing the DCT coefficients; and

variable-length coding the DCT coefficients into output data.

31. A method according to Claim 25, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein downsampling one of the prediction error and the decoded image data in the second direction comprises one of skipping one of a top and a bottom field of the frame of data when the data comprises interlaced data, and skipping every other sample line of the frame of data when the data comprises non-interlaced data.

32. A method according to Claim 25, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein downsampling one of the prediction error and the decoded image data in the first direction comprises one of skipping every other sample of each sample line of the frame of data and averaging every pair of neighboring samples of each sample line.

33. A method of transcoding data comprising a group of macroblocks representing a frame of data, the method comprising:

decoding input data to thereby generate decoded image data at a reduced resolution and downsample the input data in a first direction;

downsampling the decoded image data in a second direction different than the first direction to generate a downsampled macroblock; and

encoding the downsampled macroblock into output data.

34. A method according to Claim 33, wherein decoding input data comprises decoding input data to thereby generate the decoded image data in a spatial domain and a prediction error in the spatial domain, and wherein downsampling the decoded image data comprises downsampling one of the prediction error and the decoded image data to generate the downsampled macroblock.

35. A method according to Claim 34 further comprising:

determining to downsample and encode one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

36. A method according to Claim 33 further comprising:

converting at least one of the macroblocks of the decoded image data from a first coding mode to a second coding mode before downsampling the decoded image data.

37. A computer program product for transcoding data comprising a group of macroblocks representing a frame of data, the computer program product comprising a computer-readable storage medium having computer-readable program code portions stored therein, the computer-readable program code portions comprising:

a first executable portion for decoding input data, wherein the first executable portion is adapted to generate prediction error and decoded image data in a spatial domain;

a second executable portion for downsampling one of the prediction error and the decoded image data in at least one of a first direction and a second direction different than the first direction, wherein the second executable portion is adapted to downsample in the spatial domain to generate a downsampled macroblock in the spatial domain; and

a third executable portion for encoding the downsampled macroblock into output data.

38. A computer program product according to Claim 37, wherein the first executable portion is adapted to variable-length decode input data to generate quantized Discrete Cosine Transform (DCT) coefficients, inverse quantize the quantized DCT coefficients to generate DCT coefficients, inverse DCT-code the DCT coefficients to generate the prediction error in the spatial domain, and thereafter sum the residual blocks and motion compensation data to generate the decoded image data.

39. A computer program product according to Claim 37, wherein the first executable portion is adapted to decode the input data at a reduced resolution.

40. A computer program product according to Claim 39, wherein the first executable portion is further adapted to downsample the input data, including the prediction error and the decoded image data, in the first direction, and wherein the first executable portion is adapted to downsample one of the prediction error and the decoded image data in the second direction in the spatial domain.

41. A computer program product according to Claim 37 further comprising:

a fourth executable portion for determining to downsample and encode one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

42. A computer program product according to Claim 37, wherein the third executable portion is adapted to Discrete Cosine Transform (DCT)-code the downsampled macroblock into DCT coefficients in a DCT domain, quantize the DCT coefficients, and thereafter variable-length code the DCT coefficients into output data.

43. A computer program product according to Claim 37, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein the second executable portion is adapted to downsample one of the prediction error and the decoded image data in the second direction by one of skipping one of a top and a bottom field of the frame of data when the data comprises interlaced data, and

skipping every other sample line of the frame of data when the data comprises non-interlaced data.

44. A computer program product according to Claim 37, wherein the frame of data comprises a plurality of sample lines each comprising a plurality of samples, and wherein the second executable portion is adapted to downsample one of the prediction error and the decoded image data in the first direction by one of skipping every other sample of each sample line of the frame of data and averaging every pair of neighboring samples of each sample line.

45. A computer program product for transcoding data comprising a group of macroblocks representing a frame of data, the computer program product comprising a computer-readable storage medium having computer-readable program code portions stored therein, the computer-readable program code portions comprising:

a first executable portion for decoding input data to thereby generate decoded image data at a reduced resolution and downsample the input data in a first direction;

a second executable portion for downsampling the decoded image data in a second direction different than the first direction to generate a downsampled macroblock; and

a third executable portion for encoding the downsampled macroblock into output data.

46. A computer program product according to Claim 45, wherein the first executable portion is adapted to decode input data to thereby generate the decoded image data in a spatial domain and a prediction error in the spatial domain, and wherein the second executable portion is adapted to downsample one of the prediction error and the decoded image data to generate the downsampled macroblock.

47. A computer program product according to Claim 46 further comprising:

a fourth executable portion for determining to downsample and encode one of the prediction error and the decoded image data based upon at least one of coding, motion vectors and residual energy of the macroblocks of the group of macroblocks.

48. A computer program product according to Claim 45 further comprising:

a fourth executable portion for converting at least one of the macroblocks of the decoded image data from a first coding mode to a second coding mode before downsampling the decoded image data.